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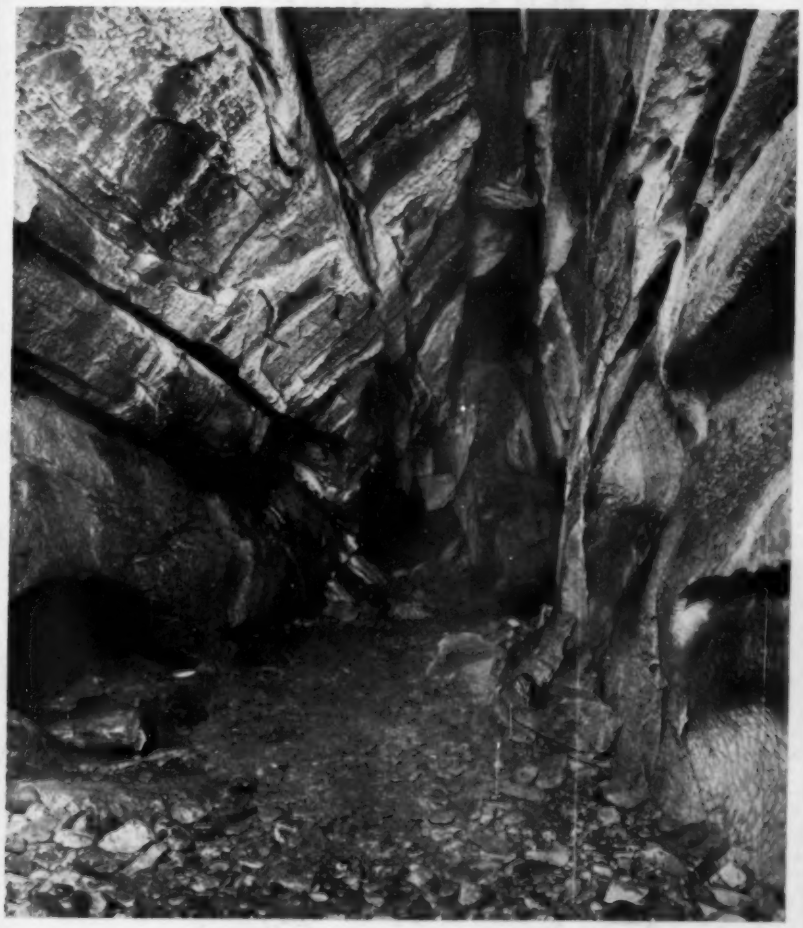
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



MARCH 7, 1936

Canadian Caves

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A SCIENCE SERVICE PUBLICATION

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The Weekly Summary of

Current Science

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Edited by WATSON DAVIS

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DO YOU KNOW?

The human brain is more than three-fourths water.

China was the first land to adopt paper money, 807 A.D.

Despite its name, the eye tooth has no closer connection with the eyes than any other tooth.

Chemical engineers say that if pure iron can be produced it may be revealed as a metal very different from the familiar iron in use.

Painting the shell of a baby turtle with enamel or celluloid paint has been known to interfere with growth, causing discomfort or even death.

The Danish method of measuring girth of cattle at the heart as a guide to the animal's weight is being adopted in this country with surprisingly accurate results.

Between two and five years of age, children learn to fear strangers and the dark, says a psychologist; and later comes a tendency to fear ghosts, imaginary animals, criminal characters, ridicule, and failure.

A woodchuck just born is no bigger than a man's thumb.

Chinese gardeners were the first to cultivate the orange for sweetness.

Excessive sunlight is believed to be a cause of silver foxes having tinged, or brown-colored, pelts.

A British writer in 1703 tried to explain bird migrations by supposing that the birds flew to the moon when they left England.

A manufacturer of packaged goods is using the "electric eye" to detect any package that is starting for the market shelf with no advertising coupon inside.

A "library of soils" has been assembled at Columbia University in New York; it includes specimens typical of erosion conditions in the United States and Canada.

"Most birds are migrants to some extent," says the Michigan Audubon Society, "as there is evidence that our supposedly permanent species go a short distance south, giving place to some of the same species from the north."

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

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How did the name Caesar originate? p. 155.

METEOROLOGY

Rainmakers Try Everything But Ol' Man Weather Keeps On

Civilized Men Make "Dumbest" Bargains With Weather Wizards; Savages Apt to Penalize Failure Heavily

By DR. W. J. HUMPHREYS,
U.S. Weather Bureau

DO WHAT we may, the weather does as it pleases.

Yet there are people the world over, and always have been, who claim that they can and do make weather, according to specifications for a guaranteed liberal fee.

A certain sporting element desired dry weather for a week's horse racing, a few years ago. And so a weather wizard was employed to the tune, according to reports, of a thousand dollars a day to prop up the clouds. That happened in New York.

Almost immediately thereafter, this same weather maker undertook, for a consideration, to break a drought with just the right amount of rain to put forest and field in the proper condition for good fox hunting. This occurred, not among aborigines in a savage land, but among sportsmen literally in sight of the Washington Monument. There was a little sprinkle of rain, in response to conditions clearly shown on the weather map, but not enough to put the ground in condition to hold the scent of game. The rain maker explained that he had not been employed in time to get his contraptions working properly.

In "civilized" countries, a rain maker generally has a contract that reads, "Heads I win, tails you lose."

Of course, those are not the exact words. But however enveloped in formal verbiage, the meaning is, "Heads I win," that is, if what I promise happens, then I get a big bonus. If it does not happen, then, "tails you lose," for you will pay me for my time, and reimburse me for my expenses. In civilized countries there are lots of people who will and do sign just such a contract.

In uncivilized countries a weather wizard often has to be more careful. For in a region where every one believes that the medicine man can get, at any time, precisely the kind of weather desired, really bad weather is to him a dangerous thing. He may be hanged for stubbornness.

If such a man is old, it is certain that for many years he has been highly weather-wise and discreetly circumspect —like the New England preacher who refused to defy Providence by praying for rain while the wind was in the northwest.

One of the most widely practised ways of trying to control weather is to imitate some feature of the kind of weather desired, in the hope and expectation that nature will take the hint and do the same thing on a large scale.

For instance, not long ago in an old and highly civilized country of Europe, when a summer shower was needed for thirsting crops, three men climbed adjacent trees. From their perches, one man waved and shook a firebrand to imitate lightning. The second man mimicked thunder by beating on an empty kettle. The third man scattered water all around from a sprinkler.

All methods of trying to mould the weather with pantomime or other magic are obviously futile. Many schemes to the same end, scientific in the sense that they depend on actual forces, have been tried, but none has ever succeeded. Nor is there any promise that they will.

One scheme for getting rain out of unwilling air, a scheme based on sound scientific principles, is to form a ring of airplanes, heads out like musk oxen on defense, tails up and propellers running at full speed. This operation, it is argued, will produce an ascending current of air, in which, owing to natural cooling by expansion, a cumulus cloud will form and abundant rain will fall.

The trouble is that this cannot be carried out on a scale big enough to be effective. Any one trying to get rain in this way would be like a souvenir hunter trying to walk off with the Washington Monument. His method would be qualitatively sound, but quantitatively altogether inadequate. He can't lift hard enough.

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ASTRONOMY

Tiny Near-By Planet is Christened Anteros

THE new tiny planetoid, one-third of a mile in diameter, known as the Delporte object (*SNL*, Feb. 29, '36) has been named Anteros by its discoverer, Prof. E. Delporte of Royal Belgian Observatory. Anteros is the mythological brother of Eros, which is the name of the little planet that once held the record for close approach to the earth.

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INDIAN PAINTS CUSTER'S FALL

Southwest Museum, Los Angeles, has received this vivid pictograph of the Little Bighorn Battle, in which General George Custer fell. The picture was painted in 1898 by sub-chief Kicking Bear, Sioux veteran of Indian wars and unreconciled to the white man's government until his death. He shows the long-haired Custer slain, figure 1. Kicking Bear himself, scalp in hand, is figure 2 in a row of important Indians. The space at figure six was intentionally blank, Chief Gall having joined Sioux who were reconciled to the government. Figure five is Sitting Bull. Irvin Cobb, who bought the picture in 1934, has lent it to the Museum.

PSYCHIATRY-CRIMINOLOGY

Baby is a Criminal

You Must Start In the Nursery to Prevent Crime; Newspapers, Radio, Parents All Have Their Influence

By DR. JOHN E. LIND, Psychiatrist, St. Elizabeth's Hospital

LET US get away from the idea that the criminal is a strange monster whose mind works in a perverted manner, whose moral sense is extinct and who is marked by physical signs of degeneration. The criminal is the same physically, and his psychological reactions are the same, as the non-criminal.

We all start out as criminals. Every baby is a perfect criminal. I mean by that that the baby is a supreme egoist. He recognizes only his own desires and everything else must be subordinate to them. He gives way to his own physical desires whenever he pleases. He demands warmth and food and comfort and howls until he gets them. To be sure his activities are limited by his physical feebleness, otherwise, he would rob and kill.

Reforming "Tough Babies"

As the baby grows older, he passes through a civilizing process in miniature. Those social ideals which it has taken humanity thousands of years to acquire are instilled into him by his family, his nurse, and later his teachers and all with whom he comes in contact. He learns that certain things are socially taboo, and that he must conform to certain requirements.

It is in this growth from babyhood to maturity that criminals are made, or socially useful citizens. As the child is taught to adjust to his family and later to his playmates and his teachers, so will he react to society in general when he grows up.

Psychological studies of some habitual criminals have revealed that their constant warring with society was in reality a symbol of the hate they once felt for a harsh father or an older brother.

But there is another way in which criminals are formed. To understand it I want to speak for a moment of a modern psychological conception called the super-ego. Put in simple terms, this means a group of ideals built up by the individual as a pattern toward which he shapes himself. These ideals he gets from various sources, perhaps some from the Bible, from conversations with his father and mother, from books he has read telling of the deeds of heroes, or from radio talks.

As a small boy, the super-ego is naturally somewhat crude and childish in its scope. The boy wants to do something big and brave and be cheered by the crowds, to be a prize-fighter, or a ball player, to save someone from a burning house, or win a race for his school. As he grows older, his ideals become more constructive and socially useful. He wishes to be a good citizen, to serve his country in some way, to discover something useful in science, or to found a business.

This is the usual course in the average boy reared in the normal American family. But think of the boy reared in the slums who has been subjected to none of these influences. As a little boy he is familiar with vice and cruelty. The hero of his neighborhood is the bully who is leader of a gang—a Micky Maguire—who steals from vegetable carts and thumbs his nose at policemen. As he grows older he joins a gang and sees with awe and respect real gangsters who have served prison terms, who carry guns, and some of whom have even killed. These are his heroes; and even above them—in his estimation—are the ward bosses, the crooked politicians, gang leaders and racketeers.

Worshipping False Images

Is it small wonder that his super-ego is built up of material far different from that of the other boy? It is inevitable that he becomes a criminal. He is, in fact, what one might term a normal criminal.

Make what fun you will of Sandford and Merton, Little Elsie, David Copperfield, and all the other prigs and prigesses of the Victorian Era, nevertheless they offered a not unadmirable ideal for the growing mind. And the Frank Merriwells and Nick Carters were not so bad, either. After all, they represented the age-long conflict between good and evil and in the last analysis they were on the side of the angels.

It all depends on what ideals are held up from earliest childhood to the growing child. In the proper, well-regulated family we have the ideal which is in conformity with social ideals; in the crowded slums we have the ward heeler, the gang-leader, the racketeer, as local heroes.

There is no criminal type. In the past, scientists have pursued this chimera. It is a very human quest. For it is very human to wish for the concrete solution to all human problems—the ancient alchemists sought for the reagent that would transmute base metals to gold, the chemists have sought for the universal solvent, the philosopher for the secret of happiness, the physiologists for the secret of life, it has been everywhere a very human failing to long for something definite and final in a world of uncertainty and speculation.

Whited Sepulchres of Crime

So it would be gratifying indeed if we could get out our little tape-measure and our calipers and our psychological tests and apply them and say, "Well, here is a robber, and here a murderer, and here a forger." But, believe it or not, human reactions cannot be measured in any such exact manner. The human being, faced with temptation, or goaded by necessity or greed, will behave in an exactly predetermined manner. But what that manner is, no one knows but one who has followed his reaction from the cradle on.

Who is the true criminal? Not the thoughtless youth who, on his way home from a party, steps the car up to 40 when the speed limit is 25, not the man who takes a drink after 2 A. M., or the underprivileged moron who grabs a pocket-book and runs; no, none of these. It is the man who betrays his trust. It is the man who knowingly, day after day and month after month, plays with the security and happiness of others. It is the man who blithely contracts debts he knows down in his heart he cannot pay, it is the lawyer who foments litigation, the doctor who advises unnecessary operations and profits by them on account of arrangements, pecuniary or otherwise, with surgeons, it is the bank official who lives for years beyond his income knowing that he has always the resources of other peoples' income, it is the public official who lends

his name and prestige to enterprises he knows to be fundamentally unsound—these are the real criminals. They are the people who really know better. The lawyer who lends his legal skill to releasing a criminal, the venal judge, the complaisant warden who gives favor to the convict with money or influence, the parole board official who is influenced by the pressure of this or that one can be added to the "true" criminal category.

All Potential Criminals

All of us, it must be remembered, have criminal tendencies, more or less well covered by the veneer of civilization or expressed in a way that is socially useful or comparatively harmless. We all have a certain delight in strife, in cruelty and bloodshed. This can be expressed vicariously in watching prize-fights, or wrestling matches, in some nations in bull-fights, and every now and then the desire to slay and to inflict suffering can be indulged in wholesale when there is a war.

I am sometimes asked, by the way, are not all criminals abnormal? The answer to this is no. I have found, in my studies, that criminals fall into five main classes:

1. The statutory criminal.
2. The accidental criminal.
3. The neurotic criminal.
4. The normal criminal.
5. The psychotic criminal.

Murderers are Nice People

The statutory criminal is the product of the law. With legislatures working night and day turning out laws it is almost impossible for the most well-meaning citizen not to break one occasionally. At times laws are enacted which are so contrary to the general feeling and desire of the people that they are violated wholesale and eventually either become a dead letter or are repealed—the Prohibition law, for example. Such statutes do not represent any moral law and their violators are statutory criminals. You or I, or our neighbors, might find ourselves in this group at any time.

Then there is the accidental criminal, the man who commits the so-called crime of passion, or who steals money entrusted to him under the pressure of great need.

Most murders, it may be said, are committed without any real premeditation. No one is more surprised, as a rule, after a murder, to see the victim lying at his feet, than the murderer himself. I have known several hundred murderers very well in my time and most of them have been the nicest, pleasantest chaps you can imagine.

"MUSCLING IN"

Children are apt to go after what they want, by direct and violent methods. Most of us "learn better" as we grow older. Those who preserve this childish tendency into adult life are likely to be classed as criminals.

When showing a visitor about the criminal insane department of which I am head, I sometimes ask him to pick out three or four inmates who he thinks might be murderers. He invariably selects a few rather coarse, rather unintelligent looking, but comparatively harmless persons. He doesn't suspect that the mild little man who retreated to his room when visitors were announced, the somewhat effeminate chap who was crocheting a belt or the polite young fellow who opened the door for him and helped him on with his overcoat, were all murderers.

Crime as Social Revenge

Also with us is the neurotic criminal; that is, the person whose offenses against society represent an emotional conflict within himself. In this group belong those individuals who seem to have an inevitable impulse to steal, even though they are rich, or set fires, the kleptomaniacs and the pyromaniacs. In such cases the abnormal quality of the crime is obvious.

Then again it is found sometimes that a habitual thief is such because of some old family difficulty. He has been, we will say, mistreated by an alcoholic father, or has been sent to reform school and treated so severely that upon discharge he has conceived a bitter hatred for society. To him courts, judges, policemen represent fathers, teachers, tyrants, and every successful felony he commits is a triumph over his natural enemies.

In the fourth classification is the normal criminal; that is, the type whose whole training from early childhood has been in defiance of law, disregard of property, and admiration of the successful criminal.

Psychotics Easily Detected

The fifth group is the psychotic criminal, or the one who is so on account of actual mental disease. They are a small group and can usually be quickly recognized by the psychiatrist. Certain types of offenses, in fact, should by their nature give rise to the suspicion of mental illness. Thus when a 60 or 70 year old respectable business or professional man is suddenly arrested for a sexual offense, we suspect he is beginning to suffer from one of those mental diseases that afflict the aged. When a person is killed and the body horribly mutilated we suspect that the murderer might have been an epileptic.

Checking crime needs to proceed along two lines, preventing it in the first place, and second, helping the criminal become a useful citizen.

The criminal is made in his formative years, when he is being subjected to

deleterious influences in the slums of great cities, or when he is getting into difficulties at home and at school and becoming a problem child. These problem children are receiving more and more attention every year—not only they, but their parents; for a problem child usually means a problem parent.

So we have parent-teachers associations, child-guidance clinics, juvenile courts and other agencies which are doing more and more effective work. We have mental hygiene clinics for poorly-adjusted adults who learn to recognize and handle their own difficulties and are thus enabled to handle their children better. The schools have psychologists and specially trained workers who take in hand children who are beginning to be at odds with society and help them over the rough spots.

Social Sanitation Needed

The ultimate reclamation of the social group who grow up idealizing crime and criminals is, of course, a Gargantuan task, involving as it does the cleaning up of the slums, the ridding cities of graft and gangsters, and so on. It is a social problem whose solution is in the distant future.

In the meantime, a certain amount of education can be done by newspapers, movies, radio programs, and by parents and others in refraining from glorifying crime in any manner.

I have often been asked whether or not I think that exciting radio programs, especially of the serial variety, dealing with crooks, with super-criminals, and with exciting and impossible adventures are harmful to children.

That is a question which cannot be answered categorically. It all depends on the child. Most children nowadays take such things as a matter of course and if their hero is left at the end of the fifteen minute program apparently about to be destroyed in a particularly painful manner, do not worry about him unduly. As one of my own small boys said on such an occasion, "Oh well, his name is on the feature and they've got to rescue him so they can go on with it."

Of course, if a nervous child is obviously upset by exciting programs or begins to show too marked a preoccupation with crime or admiration of criminals the judicious parent will ban such programs in his own home.

Coming to deal with the actual person charged with crime of any serious or habitual nature, the first step is to give the offender a mental examination. This is required by law in Massachusetts and done very generally in New York, and Maryland. The offender who has actual mental trouble or who is feeble-minded is then weeded out and placed in an appropriate institution.

Next the prosecutor and the judge should have the advice of the psychiatrist as to the disposition of the case. In other words, the criminal should be treated and not the crime. The type of person committing the offense should be fully understood, the circumstances, the motive, and the chance of its repetition should be taken into account. It is obviously useless to lock up a person for a few months who has committed the same offense a dozen times before, even though it be a comparatively trivial one.

It may very well be that a murderer could be released after a short detention with perfect safety to himself and society and a man who stole a loaf of bread should remain confined for life.

Treatment of prisoners actually in penal institutions should be determined after a thorough psychiatric study, and indeed this is coming to be done more and more. Some types of criminals, the so-called "normal" criminal I have referred to above, will require a fairly strict, even hard-boiled method of treatment, the neurotic criminal will require special treatment in an effort to cure him, and the accidental criminal may be treated with a minimum of restraint.

Criminals are Human Beings

Much has been said in criticism of the parole system. In reality it is successful in a high percentage of cases, but it is the failures which receive publicity. Aside from the evils of political pressure, the chief fault with it is that it is often administered by unqualified persons. The public is slow to understand that good intentions are not everything. A man may be a successful merchant, a good father, stand high in the councils of his church and lodge and be intensely interested in public reforms, but nevertheless be totally unfit to sit on a parole board.

Work is constantly being done in studying the criminal mind and in trying to solve the problems of prevention and reclamation. At the Baker Foundation in Boston Dr. Healy is doing notable work and at the Institute for Juvenile Research in Chicago Dr. Schroeder, and there are other workers elsewhere.

In short, we are coming to realize that the criminal is not a strange, scarcely human animal, but a person very much like you and me, who thinks, eats, breathes, talks, loves, desires, and hates just as we do. Looking upon such a one think of Kipling's lines:

"Stopped in the straight when the race was his own,
Look at him cutting it, cur to the bone;
Ask, ere the youngster be rated and chidden,
What did he carry and how was he ridden?
Maybe they used him too much at the start,
Maybe Fate's weight-cloths were breaking his heart."

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PALEOBOTANY

Minute Details of Fossils Revealed by New Method

SECRETS of the plant world which have been hidden from man for more than 200 million years may be revealed through a new microscopic technique with which scientists for the first time have been able to examine tiny fossilized cells under high magnification.

Developed by William C. Darrah, Harvard botany instructor, the improved technique enables investigators to peel a transparent cross-section less than one twenty-five-thousandth of an inch thick from a fossil embedded in solid rock. This peeling can be magnified approximately 500 times, so that study of complex cellular structures is easily possible.

Previous methods permit scientists to magnify clearly only to about 60 diameters. Fossil cross-sections are also considerably thicker and darker under older techniques of procuring them.

Armed with this new weapon, scientists are expected to be able to conduct research in fields which have heretofore been inaccessible. The discovery is expected to be of particular aid in a study of the plant life involved in the formation of petrified woods and anthracite coal.

Although botanists have never before been able to obtain satisfactory microscopic specimens from these hard rock types, Mr. Darrah has already made successful fossil peelings from both. Some of his specimens from an Illinois coal deposit have been found to contain the remains of pollen grains more than 200 million years old.

In making the cross-sections, the fossil area in the rock under examination is first polished with an abrasive wheel. The area is then treated with acid and coated with a special nitro-cellulose solution. When this has dried into a tough film, it is peeled from the specimen. On

it is retained a carbonized impression of every detail of the fossil.

The process is very inexpensive, and despite the extreme thinness of the peelings they are practically indestructible.

Under older methods, fossil cross-sections were cut with a fine diamond saw and polished until nearly transparent. This necessitated considerable care and usually required several weeks of skilled labor, making the slides rather expensive.

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PHYSIOLOGY

"Nonsense" to Say That Drink Makes Driving Safer

By DR. YANDELL HENDERSON,
Professor of Physiology, Yale University

EDITOR'S NOTE: Because of reports from New York City that reaction time of motorists was quickened after a stiff drink of whiskey, Science Service asked Prof. Henderson, eminent authority on the effect of alcohol on the human mechanism, to discuss this subject.

The relation of alcohol to motoring should be judged not only from scientific observations but also with a large measure of common sense. Two sets of observations are now offered. One tells us that the smallest quantity of alcohol causes a state of intoxication. That, in my opinion, is nonsense.

The other now reported from the Johns-Manville testing and safety truck asks us to believe that reaction time is actually reduced by a small amount of alcohol. Perhaps in the tests on the men quoted that was true, but to infer that those men or any men would drive more safely after a drink is also nonsense.

The truth for practical purposes is that the amount of alcohol in one bottle of light beer neither helps nor harms. On the other hand the motorist who has drunk half a pint or more of undiluted full proof liquor is a menace to himself and everyone. As motorists have no water available except in the radiator of the car, they drink undiluted liquor.

To lessen drunken driving requires that our standard liquor instead of being 45 to 50 per cent. alcohol shall be diluted to 30 or 35 per cent. This has been done in Sweden. It would not promote bootlegging for illicit liquor is now seldom over 35 per cent. and often only 30. Our Federal liquor tax should be changed to tax according to the percentage of alcohol and degrees of proof—high on high proof, low on low proof. That is what common sense applied to all these tests should teach us.

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REVEALS AGE-OLD SECRETS

William C. Darrah, of the Harvard botany faculty, using his new technique which permits examination of fossil wood cells under higher magnifications than have ever before been possible. The inset is a photomicrograph of fine details of petrified wood, made possible by Mr. Darrah's new process.

PHYSICS

Old Violin Makers May Have Tested By Branding

THE SECRET of how the old master violin makers determined the right kind and graininess of wood to use in their beautifully-toned fabrications now is believed found. They may have used a hot branding needle on wood which had been given a slight wax coating.

If the wood was homogeneous the melting wax formed nearly a circle around the hot needle. If the wood was inhomogeneous and possessed grain the branding tests showed a long, stretched, narrow ellipse.

Such at least is the simple test discovered by Prof. K. Lark-Horovitz of Purdue University who, for years, has been studying the composition of the wood in old violins by X-rays. From the studies, some of the mystery behind the beautiful tone of an Amati or a Stradivarius violin has been learned.

Prof. Lark-Horovitz has found, for example, that the best instruments have a top of spruce or pine and a back of maple.

The top, X-ray investigations reveal, must possess a distinct fiber structure. The back, of maple, is almost without structure if the instrument is to have a good tone.

What Prof. Lark-Horovitz never could figure out was how the old sixteenth-century violin makers, 300 years before the discovery of X-rays, were able to tell what the wood structure might be.

The only clue was the markings of branding needles which can be seen on the old masterpieces of the violin-makers' art.

From this clue Prof. Lark-Horovitz finally found the simple hot branding needle test which, in its way, might tell roughly the same facts in the hands of a master as the more modern X-rays.

"There is nothing known," explained the Purdue scientist, before the Franklin Institute, Philadelphia, "about the actual use of this method, but it might be an explanation of the many traces produced by branding needles which we see on old instruments."

Science News Letter, March 7, 1936

PSYCHOLOGY

Little Boys Cry Just As Much as Little Girls

LITTLE boys cry just as much as little girls.

So Dr. Catherine W. Brackett of the Child Development Institute, New York, has learned by timing the crying of pre-school youngsters.

Between the ages of 18 months and four years, the average child spends 2.5 per cent. of his days—or nights—crying. That makes an average crying time of 36 minutes a day.

Small children spend much more of their time laughing. They laugh, on the average, 6.7 per cent. of the time.

A laughing baby is fortunate, for Dr. Brackett says he will become a social child and will get along well with others.

Children cry more when the temperature is low, the study of crying has revealed.

Science News Letter, March 7, 1936

PHYSIOLOGY

X-Rays Show Stomachs "Froze With Fright"

X-RAY studies showing stomachs of freshmen that "froze with fright" are reported by Dr. T. Wingate Todd, professor of anatomy at Western Reserve University School of Medicine.

The freshmen in this case were medical students confronted with learning anatomy, admittedly the hardest and most discouraging course in medical school.

When he began this work in September, 1924, he said he was surprised by the large size and inactivity of the organs seen by means of the X-ray. By February, 1925, he found that the same stomachs which had been "so large and sulky," a half year before were now smaller and much more active though given the same amount of food. And by September they were stilll smaller and more active.

But in this second September, Dr. Todd also X-rayed stomachs of the entering freshmen and found them large and languid as had been those of new students of previous years.

So he concluded that stomachs of freshmen confronted by learning anatomy "froze with fright."

Further study devised an ingenious method of estimating the volume of the stomach from measurement of its X-ray shadow. This also revealed that a stomach which had been fed 12 ounces of milk might secrete gastric juice to make the organ actually contain 20 or 30 ounces of fluid.

At this point, Dr. Todd turned his attention to the outlet from the stomach to the duodenum, where a thick, muscular belt surrounds the orifice or pylorus. He found that in unquiet stomachs this orifice remains closed for a long time after food is swallowed, but in students well accustomed to the investigation, it permitted passage of the contents within two minutes.

Here was the explanation of large, inactive stomachs.

Dr. Todd further found his conclusions checked by the fact that today freshmen who have become accustomed to the X-ray study have more active stomachs than those he studied in 1924 who had not been prepared for the study. But that 1935 stomachs, on the day of a final examination, or under conditions of mental stress, once more relapse into the behavior patterns of 1924.

Similarly, Dr. Todd's study revealed that this condition is apt to follow eating foods to which a person is sensitive and that closing of the pylorus may act as a trigger mechanism which releases all sorts of ill-feelings, drowsiness, and general misery.

Dr. Todd's study has unusual value in that it is the first of its kind ever made with normal, healthy stomachs, practically all previous stomachs observed through the X-ray having been those of patients in hospitals, or at least being known as not behaving normally. His 800 young medical students were probably as healthy a lot of young people as could be found.

Science News Letter, March 7, 1936

INVENTION

New German Dictating Phonograph Uses Disks

A DICTATING phonograph, for business and other purposes, has been patented in Germany that uses disk records instead of the familiar wax cylinders. The disks are cheaper than the cylinders, and much lighter and less breakable. They are made of a gelatin compound. (*Die Umschau*, Feb. 9).

If desired, a disk can be used as the letter itself, instead of being transcribed by a typist. Large envelopes and backing sheets of stiff cardboard are provided, and the flat shape makes mailing easy.

Science News Letter, March 7, 1936

IN SCIEN

ZOOLOGY

Rare Mountain Zebra Is Near Extinction

ONLY fifty or sixty of South Africa's rarest animal, the mountain zebra, are left alive, and no funds are available for the further protection of the two small herds, Dr. E. L. Gill, director of the Cape Town Natural History Museum, has announced.

A strict law for the protection of this animal was passed some time ago, but has never been really enforced, so that hunters have done their worst. There were 2,000 animals a few years ago, only fifty or sixty now, and this small fragment is apparently doomed.

Science News Letter, March 7, 1936

INVENTION

"Electric Memory" Turns On Driving, Parking Lights

DANGER of driving without lights at night is claimed to be reduced to a minimum by the "fool-proof" automatic control system for automobile lights recently patented by George Paulson, of Erie, Pa.

Turn on the ignition switch and on go the headlights. And as long as the car is operating at night it is impossible to cut the lights in the usual way.

Then there are also these features in the invention: In a city where parking lights are required, it is not necessary to remember to turn them on when it gets dark or snap them off when dawn breaks. The patented control system "remembers" to do all this for car owner.

All that is necessary is to set two clock-like hands on a time dial—one at the time the lights are to go on, the other when they are to be turned off. For example, if the lights are to go on at seven you set one hand at 7:00 p. m. If the parking lights are to go off at 6:00 you set the other hand at 6:00 a. m.

An eight-day clock mounted on the dash operates various mechanisms to open and close a switch in accordance with the setting of the hands. The control clock is automatically wound.

Science News Letter, March 7, 1936

ENE FIELDS

PHYSICS

Supersonic Waves Used In Testing Steel Samples

SOUND waves, vibrating so rapidly that they are far above the range of human hearing, are now being used in a method for testing samples of steel and other metals for flaws.

They belong to the class of vibrations known as supersonics, and are produced from electrically excited quartz crystals. Their rates of vibration can run into scores of thousands, or even hundreds of thousands, of cycles per second. Human hearing stops at about 20,000 cycles per second.

In testing metals, the sample is ground flat on both ends. One end is set against a supersonic crystal, the other against a tiny dish of oil. The vibrations are transmitted through the metal to the oil, and throw its surface into a network of minute waves.

A beam of light is projected through the oil. Striking the minute waves, it is broken up into a rainbow pattern, which can be observed on a white screen laid beneath the dish. If the metal sample is uniform in structure throughout, the pattern is steady and even, but if there is a flaw present the pattern is thrown into disorder.

Science News Letter, March 7, 1936

SEISMOLOGY-ENGINEERING

Quake-Resisting Strength For Buildings Shown

COULD the building where you work, or the house or tall apartment you live in, stand being banged on one side with a hammer one-tenth as heavy as itself? And the blow repeated on the other side a moment later?

That is how stout the structure has to be, to give it a reasonable chance to stand up against an earthquake, Capt. N. H. Heck of the U. S. Coast and Geodetic Survey indicated. This factor for quake-safety of a building—resistance to a horizontal pressure equal to a tenth of its weight—was first set up by Japanese architectural engineers, and is now used in the United States, Mexico, Italy and Greece.

"This works out excellently for some types of buildings," said Capt. Heck. "It was successful in many cases in the Japanese earthquake of 1923, though in Tokyo some of the buildings were subjected to much greater acceleration than this method takes into account."

Even at that, however, the method is more or less empirical, Capt. Heck suggested. Instruments for obtaining really exact engineering data on the thrust and rack of the earthquake shock did not exist when it was adopted, and have only recently come into use.

The most useful instrument of this type, he indicated, is the one known as the accelerometer, of which several patterns have been invented. Unlike the ordinary seismograph, which runs continuously, the accelerometer does not start recording until the earth begins to shake. The first jolt of the earthquake is the signal for it to start reeling off the recording paper on which its zigzagging pen can write the story of the earth-shaking events. It is thus possible to set up an accelerometer and go away and leave it for months or years, visiting it only after an earthquake of proper magnitude has occurred in its vicinity.

With instruments of this type, it will be possible to gather more exact information, for the building of structures better able to resist the thrust and twist of quakes when they come.

Science News Letter, March 7, 1936

RADIO

Field Tests On Television Promised Within 8 Weeks

FIELD tests of television will begin in the New York area within eight weeks, states the annual report to the stockholders of the Radio Corporation of America.

The field test, emphasizes David Sarnoff, president of RCA, does not mean that regular television service is at hand. Transmission from studios atop the Empire State building will be pioneering tests to estimate and define the possibilities of the system under actual working conditions rather than the refined and controlled laboratory conditions of the past.

Problems to be solved during the tests will include: determination of how far transmission can be achieved; with what consistency and regularity can pictures by television be transmitted in the present stage of development of the art; and the possibilities of the television camera for indoor and outdoor pick-up.

Science News Letter, March 7, 1936

GEOLOGY

Caves in Canadian Mountain Have Impressive Forms

See Front Cover

CAVES in the limestone strata of the Canadian Rockies just across the boundary from our own Glacier National Park, have an architecture all their own, different from the stalactite-pillared development familiar in most limestone caverns. While dripstone is not absent, it is not as abundant as it is elsewhere, and the rugged form of the rock itself is more in evidence, as shown here in the cave popularly known as the Dining Hall. Many geologists believe that earthquakes as well as underground running water had their share in the shaping of these caverns.

Science News Letter, March 7, 1936

MEDICINE

Appendicitis Attacks Men Much Oftener Than Women

A YOUNG man is twice as likely to have appendicitis as is his sister or wife.

This disease that fills the surgical wards of our hospitals is more prevalent among adolescents and young adults than among others, and much more frequent among men and boys than among women and girls. This is one of the conclusions to be drawn from a report of three Cincinnati physicians, Drs. Mont. R. Reid, D. Henry Poer and Paul Merrell, who have recently studied the records of about 3,000 cases of appendicitis admitted to Cincinnati General Hospital. Details of their study appear in *The Journal of the American Medical Association.* (Feb. 29)

It does not pay to trifle with the disease or to delay surgical treatment. These physicians say that the appendicitis death rate is going to remain high as long as persons are not operated on earlier. When there is delay, complications are more frequent and the hospital stay must be longer.

The average time that elapsed in the 2,921 cases studied was 3.8 days between the first symptoms and admission to the hospital—much too long for proper surgical treatment, the doctors state.

It does not pay to wait for a second acute attack, their figures make clear. Of the cases they studied, 60 per cent. were admitted during the first attack, and in about 40 per cent. of all cases admitted the appendix had ruptured.

Science News Letter, March 7, 1936

DR. JOHN A. WILSON

ARCHAEOLOGY

Young Egyptologist Named To Succeed Prof. Breasted

THE far-flung expeditions and researches into the past of civilization conducted by the Oriental Institute, University of Chicago, are to be directed by a comparatively young Egyptologist, Dr. John A. Wilson. Announcement of Dr. Wilson's appointment as acting director, to succeed the late Prof. James H. Breasted, has been made by the president of Chicago University.

Dr. Wilson is 36 years of age and was a pupil of Prof. Breasted's in his study for the Ph.D. degree in Egyptology. Since then, he has accompanied expeditions to Luxor, Egypt, sent out by the Institute to copy and study inscriptions on the ancient walls. He is author in collaboration of several volumes on Egyptian writings.

Science News Letter, March 7, 1936

RADIO

March 10, 3:15 p. m., E.S.T.

ADVENTURES IN COLOR—Charles Bittinger, artist-physicist of Washington, D. C.

March 17, 3:15 p. m., E.S.T.

THE "IRISH" POTATO — Dr. F. J. Stevenson, United States Bureau of Plant Industry.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

MEDICINE

New Childbirth Anesthetic Gives Safe Refreshing Sleep

Tried in Five Hundred Cases in Washington, D. C. Paraldehyde-Benzyl Alcohol Scores Complete Success

A SAFE way of taking the suffering out of childbirth has long been a goal of medical scientists as well as the prayer of countless mothers the world over. One by one, various anesthetics and pain-killing agents have been tried —chloroform, ether, nitrous oxide or "laughing gas," twilight sleep, to name a few familiar ones.

Some have been rejected because of danger to mother or child. Others were of limited use because complicated apparatus and skilled anesthetists were needed to give them. Others have brought only partial relief of suffering, or have relieved the pain in some cases and not in others.

Latest step in the long quest is the development of a new anesthetic mixture consisting of paraldehyde and benzyl alcohol. It was developed in the pharmacology laboratories of George Washington University's medical school by Dr. George B. Roth, in collaboration with Dr. Howard F. Kane, head of the obstetrical department where it was given its clinical trial on mothers in childbirth.

Safety is one of the greatest advantages of the new anesthetic mixture. It is only mildly toxic, and if pure and properly given is considered safer than any of the other methods used to relieve suffering in childbirth. It has been tried in 500 cases at George Washington University Hospital and no ill effects have been noted in mother or child. It can be easily given, another big advantage.

After the injection, in almost every case, the mother falls into a deep, refreshing sleep. The mother can be roused to answer questions, and occasionally is a bit restless. But when she awakens, hours after her child has been born, she has no memory of the experience at all and has suffered no pain during the birth process.

Another of the advantages of the new anesthetic is the fact that the babies are in much better condition when they are born. They do not need to be slapped or held upside-down to make them start breathing. They cry normally almost immediately after birth and are pink and healthy looking.

The chemicals which are responsible for this safe relief of childbirth pains have been known for some time. Paraldehyde is what is known as a hypnotic and has been used to quiet victims of delirium tremens and nervous disorders and as an antidote to strychnine, Benzyl alcohol is a mild local anesthetic and was added to overcome difficulties in the administration of the paraldehyde.

The paraldehyde-benzyl alcohol mixture is not, Dr. Kane points out, suitable for use in surgical operations.

Science News Letter, March 7, 1936

MEDICINE

Mother Tells Experiences With New Safe Anesthetic

By a Mother Who Had a "Paraldehyde" Baby

This was written by the wife of a Washington, D. C. medical scientist. She was one of the many obstetrical cases upon which the new painless childbirth drug, a mixture of paraldehyde and benzyl alcohol, was given its clinical trial.

Like every woman, I suppose, who is expecting her first baby, the delight at the thought of the coming child was overshadowed by my dread of the actual childbirth. I tried not to remember the too-vivid accounts I had heard of other women's sufferings. Perhaps because I am a medical scientist's wife, I had heard more of these than most women. Even the knowledge that I was to have a new anesthetic to help me through my ordeal, one which my doctor assured me would deaden the pain absolutely, failed to lessen my fear when the time actually came to go to the hospital.

What happened exceeded my most optimistic hopes. The experience was not only painless but most restful as well. They gave me an injection and presently I fell asleep. When I awoke I felt much refreshed and was surprised to learn that my baby had been born hours before.

The doctors and nurses told me that I seemed to know something of what was going on, and answered their questions lucidly, though they could see I was not suffering. But I don't remember anything about that.

I went to the hospital for my next child's birth with entirely different feelings from those I had the first time, I can assure you. I feel willing now to have any number of children, if I can have them all with the aid of this wonderful new anesthetic.

Science News Letter, March 7, 1936

SURGERY

Caesar Was Not Born by Caesarean Operation

JULIUS Caesar, contrary to widespread belief, was not born by means of a Caesarean operation. Neither did he have anything to do with enactment of the old Roman law that forbade burial of a woman who died in pregnancy before the body of the unborn child had been removed by surgery.

The old myth about Caesar and his birth is exploded by Dr. John Harold Couch of Toronto General Hospital and Herbert Newell Couch, assistant professor of Greek at Brown University, Providence, R. I.

A reason for the persistent linking of Caesar's name with the operation is given by the Couches. (*Canadian Medical Association Journal*, Feb.) The reason is quite the reverse of the traditional belief. Instead of the operation being named for Caesar, Julius Caesar's family probably got their name from it. The Couches explained it as follows:

"It is altogether probable that some distant ancestor of his was born by means of a Caesarean operation, performed on a dead mother, and the cognomen of Caesar, which is derived from the verb *caedo*, to cut, was attached to the newborn child for that reason. Another Roman family, bearing the name Caeso, may have derived their cognomen from the same cause. Such a method of assigning names would be entirely in harmony with the early Roman traditions. In fact, Pliny is the authority for this assumption, for in his Natural History he remarks that certain people were born by an incision of the mother and that 'the first of the Caesars' was said to have been born in this manner."

No one knows just who the first of the Caesars was, but he was not the Julius of historic fame. More than a hundred years before this dictator was born there is a record of a Sextus Julius Caesar in Sicily.

Further evidence of the inaccuracy of the old tradition about Julius Caesar's birth is cited by the Couches.

"Not until long after the days of Julius Caesar was the Caesarean operation successfully performed on living women, and it is a matter of historical record that Julius Caesar's mother, Julia, lived for many years after his birth."

Science News Letter, March 7, 1936

MEDICINE

Finds Itch Not Limited To the Poorer Classes

DO NICE people have the itch? Indeed they do, finds Dr. John H. Stokes of Philadelphia, who reports on 53 cases of scabies found among "the better feathered, the silver spooned and the intellectual and professional elect" in his practice.

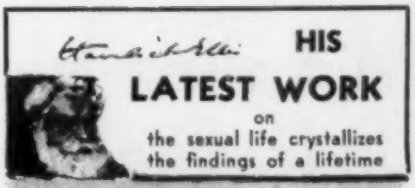
"Scabies may with equal force invade a pedigreed school, Camp Wawa Wawa or the baronial castle on the hill," the Philadelphia physician writes in *The Journal of the American Medical Association* (Feb. 29) under the title, "Scabies Among the Well-to-do: Some Principles Illustrated by the Elite."

The late war, current human migrations South in winter and North in summer and the fluidity of present-day populations all contribute toward making the itch an ever-present consideration without social boundaries.

Most of this physician's itching tycoons and subdebs had been to one or more doctors without relief. These doctors, believing that nice people do not have scabies, had not found the little itch-mite that burrows down into the skin and causes all the nocturnal scratchings.

Science News Letter, March 7, 1936

Pocket-size sundials are carried in China as timepieces.



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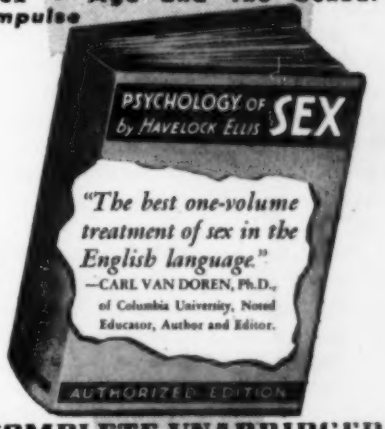
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PHYSICS

Michelson-Morley Experiment Under Fire in Discussion

Practically Unknown Canadian Mathematician Gives New Formula That Shakes Foundations of New Physics

A KEEN-MINDED, elderly Canadian mathematician from Montreal, lacking what is commonly regarded as accepted academic affiliation, wrote abstract mathematical formulae on the blackboard in the lecture room of Columbia University's Michael Pupin Laboratory of physics, and presented evidence that seriously challenges some of the basic concepts of twentieth century physics. The challenging report was presented before the American Physical Society meeting.

Reading like a roll call of famous scientists were the names drawn into the discussion of the mathematical symbols, for behind the cryptic chalk marks on the blackboard were implications which seem to challenge, clarify and yet support in a most paradoxical fashion the work of such men as Einstein, Michelson, Morley, Miller, Lorentz and Fitzgerald.

Except to a physicist those names may mean but little, yet they represent the men who by experiment and theory were instrumental in creating Einstein's special theory of relativity in 1905.

The symbols on the blackboard aroused the discussion because they raise once again the question of the validity of the theories on which the classic Michelson-Morley experiment to determine the ether drift was based. When one recalls that the Michelson-Morley experiment served as one of the inspirational "springboards" from which Einstein started his special theory of relativity the importance becomes clear.

Is Einstein's relativity wrong or is it strengthened? Has the Michelson-Morley experiment and its many repetitions been a mere scientific mirage? Was the ingenious hypothesis of Lorentz and Fitzgerald to explain the negative results of Michelson and Morley's experiment mere needless speculation? Those are some of the questions which scientist are trying to puzzle out from the chalkmarks of the Canadian mathematician.

Who is this man who, with his equations, may potentially clear up a forty-year old scientific problem?

He is William B. Cartmel, from the University of Montreal, and a fellow of the American Physical Society.

For years Mr. Cartmel has been working to find out what possible reason there might be for the great discrepancy between the negative results of Michelson and Morley in their ether drift experiment and the definite positive results obtained by Prof. Dayton C. Miller over a period of many years.

Prof. Miller's results stand alone, like a high mountain in a flat plateau country, among the results of the original experiment and the many repetitions since then. If Miller's results are right, then Einstein's relativity theory of 1905 is wrong. If Miller's results can be shown to be consistent with those of all the other investigators, then the theory of relativity is strengthened, for one of the biggest experimental objections will have been removed.

MOTHER AND DAUGHTER

In a pose of affection stand these first ladies of Egypt of almost 5,000 years ago.

Mr. Cartmel claims that his mathematical interpretations account very well for the results of Prof. Miller, and account at the same time for all the other results obtained from the original Michelson-Morley experiment right down to the present. That is his claim, and today scientists are puzzling over his equations and the basic postulates which underlie them to see if Cartmel's claims are valid. If they are one of the biggest science stories of the last forty years can be told. If not, Cartmel will be just one more name added to the sizable and distinguished list of those who have tried to crack one of the most difficult problems of physics.

Science News Letter, March 7, 1936

ARCHAEOLOGY

Restored Statuette Holds Unique Royal Portraits

EXPERTLY restoring a shattered stone statuette from Egypt, the Boston Museum of Fine Arts finds itself possessing a unique portrait group of two historic queens.

The figures, cut out of yellow limestone by a master sculptor, represent Queen Hetep-heres II, who was the daughter of Cheops of pyramid fame, and her daughter Meresankh III. They were first ladies of Egypt almost 5,000 years ago.

Mother and daughter turn slightly toward each other, in this ancient stone version of the modern family photograph. The left arm of the mother queen is back of her daughter's neck. The only paint left on the statuette is black, on such features as hair, eye brows and pupils. Dresses were probably white. Natural yellow of the stone may have been left uncolored to represent flesh, since artists in Egypt regularly colored a woman's skin yellow.

The fragments were discovered by the Harvard University-Boston Museum of Fine Arts Expedition to Egypt, in the royal cemetery at Giza in 1927. Identity was proved only a few months ago, when cleaning revealed an inscription on the base, and efforts to reconstruct the figures were made.

"That the statuette is an important addition to existing works of the Fourth Dynasty there is no doubt," declared Dows Dunham, assistant curator of Egyptian art. "Its place of origin, and date are accurately known. It represents historical personages, and it is unique in pose and grouping."

Science News Letter, March 7, 1936

PHYSICS

Atomic Physics Must Discard Conservation of Energy Law

THE BASIC law of nature that inventors are always trying to circumvent when they build perpetual motion machines—the law of the conservation of energy—may have to go by the board. This is the suggestion of no less a person than Prof. P .A. M. Dirac of Cambridge University, who was the co-winner in 1933 of the Nobel prize in physics.

Prof. Dirac asks, "Does the law of the conservation of energy hold in atomic processes?" (*Nature*, Feb. 22). And lest inventors think they now have good authoritative backing for their perpetual motion machines, let them note that Prof. Dirac specifies atomic happenings and not those of the large-scale everyday world.

Conservation of energy, believes Prof. Dirac, does not hold in processes involving very high velocities comparable with the speed of light, nor need it hold in happenings involving radiation.

New experimental findings (*Physical Review*, Jan. 1) of Dr. Robert Shankland of the University of Chicago, states Prof. Dirac, do not agree with the previous work and can only be interpreted if the conservation of energy law is given up. Says Prof. Dirac:

"Physics is now faced with the prospect of making drastic changes in its fundamentals; changes involving the giving up of some of its principles which have been most strongly relied upon (the conservation of energy and momentum)."

The important consequence, states Prof. Dirac, is that energy and momentum are conserved in atomic processes when the velocity is small compared to light's velocity, just as they are in the large scale world. The whole present quantum theory, therefore, can be retained if so applied. But the newer quantum electrodynamics used to explain radiative processes must go because of the high velocity of radiation quanta.

The new experimental work which inspires Prof. Dirac's sweeping statement was performed by Dr. Robert S. Shankland at the University of Chicago at the direct suggestion of Prof. Arthur H. Compton. It involves shooting gamma rays from radium at scattering material of aluminum, filter paper, beryllium, paraffin and air.

As the gamma rays hit the scattering material, electrons are shot out. The angle of distribution of these electrons and their energy constitute factors in what is known as the Compton effect, which won for Prof. Compton the Nobel prize in physics in 1927.

From his original experiment Prof. Compton went on to develop a theory, explaining the phenomenon, which satisfied the laws of the conservation of energy and momentum. He and other investigators performed, ten years ago, experiments which appeared to substantiate the theory.

But now, Dr. Shankland with newer and more refined equipment, developed in light of experimental advancement in the last ten years, has repeated the experiment and has found contradictory results.

It is on this new result that Prof. Dirac bases his belief that it is time to throw out the conservation of energy in atomic experiments.

Science News Letter, March 7, 1936

ARCHAEOLOGY

WPA Project Shields Historic Indian Village

A WPA project is protecting from floods and erosion the historic Indian village at the foot of Spanish Hill, northern Pennsylvania. The historic site, discovered two years ago by Ellsworth Cowles, archaeologist for the Tioga Point Museum, is identified as the Carantouan Indian village visited in 1615 by Champlain's scout, Stephen Brulé.

If further explorations can be made before a gravel company disturbs the outlying cemeteries, it is expected that important finds revealing the aboriginal life of a few centuries ago will be made.

Excavations at the village have disclosed new features of Indian technique for defense. Besides the palisade that enclosed the village, additional post holes at two corners indicate there were inside parapets, such as figured in sketches by Champlain. That the parapet was used in defending the village and as a primitive fire tower is suggested by such clues as piles of stone nearby, a wrecked jar of considerable size outside, and a fragment of palisade charred by fire.

Long black outlines in the clay subsoil sketched for the explorers a big fallen gate which stood about 12 feet high and had crossbars. The place where the Indians worked at pottery making is indicated by discoveries of potsherds at a fine bed of blue clay at the stream bank to the east.

Science News Letter, March 7, 1936

American Institute Medal Award to John C. Merriam

THE American Institute's Gold Medal, awarded annually, has been presented to Dr. John C. Merriam, president of the Carnegie Institution of Washington, "for his discoveries in paleontology, his effective promotion of research, and his recognition of the place of science in human affairs."

Fellowships of the American Institute, awarded for the first time this year, were presented to Dr. Harrison E. Howe, editor of *Industrial and Engineering Chemistry*, and to Howard W. Blakeslee, science editor of The Associated Press. Fellowships are awarded to persons who have done "outstanding work in the interpretation of scientific, industrial or engineering developments which promote the effectiveness, the knowledge and the understanding of these arts and sciences."

Science News Letter, March 7, 1936

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AGRONOMY

NATURE RAMBLINGS
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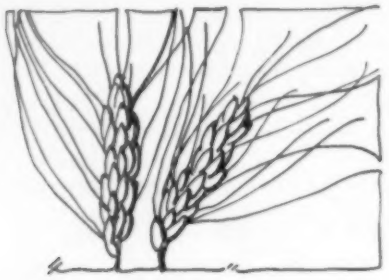

Money Won't Stop Dust

CONGRESS has reacted typically to the renewed menace of blowing clouds of soil-destruction from the Southwest's "dust-bowl;" a call for an emergency appropriation has been introduced, and will probably be passed. Presently the listing-plows will be throwing furrows across the direction of soil drift, in an effort sadly reminiscent of the tide-stemming endeavors of King Canute.

Driving these dust-checking furrows is not quite as futile as Canute's gesture; it does hold the dust back a little. And since it is the one human effort that can be put forth in the face of the man-released malevolence of nature, it is worth doing, if it were only to save our self-respect.

But no one should nurse the illusion that the spending of money by Congress will really remedy the situation. Money won't stop dust. The only real cure for the "dust bowl," that dry ulcer on the national body, is rain, that will give the grass leave to grow again, holding the now truant soil particles in the manifold tenacious fingers of its roots.

And the coming of rain to this sorely afflicted region is something quite out of the control of man. If we should blow in the price of a whole fleet of battleships, instead of the really modest two million dollars which is all the Oklahoma congressmen are asking, we could not cause a drop of rain to fall there, or a blade of the late lamented buffalo grass to sprout.

The plight of the "dust bowl" is the plight of Tantalus—water all about, but a deadly thirst still unslaked. The disturbances, or "lows" that bring rain and snow have swung to the north, bringing the blessing of snow to the once drought-blighted lands of the Northwest. They have swung to the south, bringing rain to the Gulf area. But the fatal corner, where the states of Colorado, Kansas, Oklahoma, Texas and New Mexico touch boundaries, has known only skies that are pitilessly dry.

The Great American Desert, that spread itself over the maps of the West in Thomas Jefferson's day, turned out to be a myth. But in our own day, thanks to wheat-boomers' disregard of the warning of "botany perfessers," we have made ourselves a neat little cold inferno of an American Gobi. Only grace from above, in the form of rain, can bring redemption. Our own penance, though expressed in the form of the holy American dollar sign, may palliate, but cannot undo the mischief we have wrought.

Science News Letter, March 7, 1936

AVIATION-RADIO

Patent Claims Television Can Land Plane in Fog

HOW television may eliminate many of the hazards of blind landings in even the densest fog and blackest night by figuratively providing the pilot with fog and night piercing eyes, is revealed in a U.S. patent granted to John Hays Hammond, Jr., noted for his inventions of navigational guide systems, and son of the famous mining engineer.

Bridging the fog-filled gap between plane and airport, radio waves travelling with the speed of light carry a picture of the landing field to the pilot, simultaneously with data of the exact position of his plane over it, the direction of his flight, his altitude, wind velocity and wind direction—all the data he needs for a safe landing.

The sending of the picture is accomplished with the aid of television which some experts say will be here on an everybody basis within two to five years.

Here briefly is how the inventor's patented system does it:

As the airplane approaches the field, it sends out radio signals. These, or the roar of the plane's propellers, are picked up on the landing field by delicate direction finders, like those used by armies to detect and trace the position and direction of flight of enemy planes.

The direction finders, operating complicated mechanism, trace this information by means of a tiny light bulb, which moves over a photograph or facsimile of the airport and the surrounding landscape with its hills, river, forest, high chimneys and church steeples. At any instant the position of the light bulb on the facsimile indicates the exact position of a plane over the field, while an arrow hooked up with the bulb points in the direction of flight.

A television transmitter now televises the whole picture from the airport via radio waves to the pilot, together with the other data already mentioned. This picture appears before him on the television receiver attached to the instrument panel of the plane. The aviator, therefore, will always have in front of him a view of the landing field and the surrounding country with a bright spot of light indicating the position of his plane over the field, so that he can make a safe landing at night or in fog.

Inventor Hammond also contemplates the use of his television navigation guide to aid the movement of ships.

Science News Letter, March 7, 1936

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•First Glances at New Books

History of Science

OSIRIS: Volume I, January 1936—Ed. by George Sarton—*Saint Catherine Press, Ltd., Bruges,* 777 p., $6.; To members of the History of Science Society, $5. Remittances should be sent directly to the secretary of the Society, Mr. F. E. Brasch, Library of Congress, Washington, D. C. The feast of manuscripts set before Isis was so bountiful and rich that Dr. Sarton launched these "studies on the history and philosophy of science, and on the history of learning and culture" in order that more and longer papers might be incorporated in the written record. Fittingly dedicated to Prof. David Eugene Smith and containing a bibliography of his writings, there are some forty papers in this inaugural volume.

Science News Letter, March 7, 1936

Philosophy

RETURN TO PHILOSOPHY—C. E. M. Joad—*Dutton,* 279 p., $2.50. A stimulating, thought-provoking book which, once opened, it is difficult to lay down. If you are one of the talented men-of-affairs described by the author, and in late middle-age have evolved a philosophy which will explain the cosmos, you may take warning from this volume. If you have not given much thought to the meaning behind the modern scene, you may by this work be inspired to do so.

Science News Letter, March 7, 1936

History

THE SPANISH MAIN, FOCUS OF ENVY, 1492-1700—Philip Ainsworth Means—*Scribner's,* 278 p., $3. A history of the most colorful, rich, and alluring area that explorers found when they sailed to take the New World. Spain pursued the gold and other advantages, and boldly sought a Spanish monopoly. Her two-hundred-year struggle with rival colonizing nations became Titanic, as the author builds up the picture from researches into many original sources.

Science News Letter, March 7, 1936

Economics

A WORLD PRODUCTION ORDER— F. M. Wibaut—*Allen & Unwin, London,* 240 p., 6s. Obsolete and outworn is our present system of production and distribution. That is the thesis of this book which vigorously urges the establishment of a system of production directed to raising low standards of living all over the world, maintaining equilibrium between production and consumption. It is held that the League of Nations and the International Labor Institute contain the germ of international and national organizations needed for building up ordered production on the basis of democracy.

Science News Letter, March 7, 1936

Psychology

THE PSYCHOLOGY OF DEALING WITH PEOPLE—Wendell White—*Macmillan,* 256 p., $2.50. Teachers, salesmen, politicians, and parents are not the only persons in this world who need to influence their fellow humans. You will find in this book many useful hints that you can profitably try on others and, possibly, on yourself.

Science News Letter, March 7, 1936

Psychology

ADULT INTELLIGENCE — Theodore Weisenburg, Anne Roe and Katharine E. McBride—*Commonwealth Fund,* 155 p., $1.40. The report of research in which a battery of mental tests was administered to "normal" adults aged from 20 to 60.

Science News Letter, March 7, 1936

Radio

MAKING A LIVING IN RADIO—Zeh Bouck—*McGraw-Hill Co.,* 222 p., $2. Practical information for the reader interested in sizing up opportunities in radio. The gold rush era in radio is over, the author points out. The field now is highly competitive, and success is apt to go to the best trained. What the situation is now, as regards announcers, engineers, service men, and other specialized employees, is explained with good advice for the determined beginner.

Science News Letter, March 7, 1936

Chemical Technology

TECHNICAL ASPECTS OF EMULSIONS —H. Freundlich and others—*Chemical Publ. Co.,* 150 p., $4. Reprint of the papers read at the symposium on the subject in London in December, 1934.

Science News Letter, March 7, 1936

Mental Hygiene

A WOMAN'S BEST YEARS—W. Béran Wolfe—*Emerson Books, Inc.,* 268 p., $2.25. Here is an excellent book which might well become the vade mecum of every woman over thirty. The author has had much experience with the special diseases, both physical and nervous, which afflict women and he knows and discusses all the problems that the woman past thirty years must face. It is an encouraging book, because the author knows that every woman can stay forever young, and it is a helpful book because in it the author gives practical advice on how to stay young and be happy and how to face and solve all the difficult problems of middle age. The advice is all sound mental hygiene and it is written in delightfully readable style.

Science News Letter, March 7, 1936

Chemistry

ORGANIC CHEMISTRY — Howard J. Lucas—*American Book,* 686 p., $3.60. A text used at the California Institute of Technology which follows the newer fashion of emphasizing the underlying principles rather than surrounding the student with the enormous mass of detail which the field necessarily includes. Molecular structure is given early and applied throughout.

Science News Letter, March 7, 1936

Archaeology

NEW ARCHAEOLOGICAL SITES FROM THE STATE OF FALCON, VENEZUELA—Gladys Ayer Nomland—*Univ. of California Press,* 114 p., 6 pl., 20 figs., $1.50. Describes excavation of three villages, apparently altogether prehistoric, in a region of northern Venezuela that has been somewhat neglected archaeologically.

Science News Letter, March 7, 1936

REPORT OF THE SECRETARY OF THE SMITHSONIAN INSTITUTION AND FINANCIAL REPORT OF THE EXECUTIVE COMMITTEE OF THE BOARD OF REGENTS FOR THE YEAR ENDED JUNE 30, 1935—Smithsonian Institution — *Govt. Print. Off.,* 90 p., Free upon direct application to Smithsonian Institution, Washington, D. C.

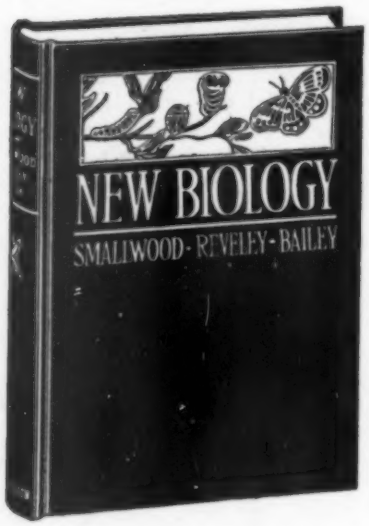
Science News Letter, March 7, 1936

Science News Letter will secure for its subscribers any book or magazine in print which was published in the United States. Send check or money order to cover regular retail price ($5 if price is unknown, change to be remitted) and we will pay postage in the U. S. When publications are free, send 10c. for handling. Address Book Dept., Science News Letter, 2101 Constitution Avenue, Washington, D. C.

BIOLOGY: How does it Educate?

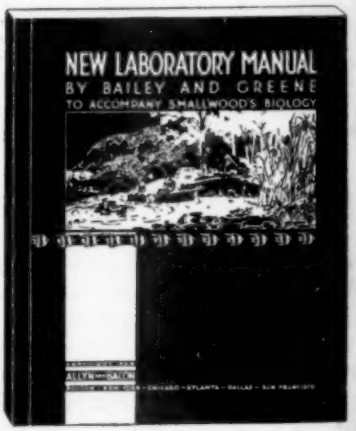
GENERAL biology offers the pupil a dramatic experience in a new realm of interest, with new tools and a new point of view.

For the young pupil there is romance in the discoveries of great biologists which have done so much to benefit humankind,—in the persistent warfare which the quiet Pasteur waged against disease, in Harvey's tireless effort which resulted in the discovery of the life-stream, in Koch's activities which resulted in the increasing control of the white plague.



In general, biology is the study of the fundamental functions of living things, thus enriching the student's own life; in particular, it is the creating of scientific attitudes toward ourselves and our living environment. It parallels in its objectives the cardinal aims of education.

The biological unit is the *living* individual. It is through the study of the life processes common to all living things that the fundamental facts of human living are learned. Out of this mass of old and new facts comes the knowledge of the interrelationship of man to the plant and animal world. The need for conservation of plant and animal life and the need of development and improvement of all living organisms result as a natural corollary.



The textbook is the medium for transmitting facts. It should not only teem with facts, but it must provide a program of pupil activities. It must furnish plenty of indoor laboratory work for the discovering of facts and proof, and field work for stimulating interest in life processes. It must emphasize Health by establishing habits of physical and mental well-being; Vocation by discovering interests and aptitudes as a help in vocational guidance; Leisure by developing leisure-time activities; Citizenship by presenting situations which have direct bearing on home life, group conduct, and human service.

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